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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Richard P. Berg, Esq.
c/o LADAS & PARRY
Suite 2100
5670 Wilshire Boulevard
Los Angeles, CA 90036-5679

EXAMINER

NADAV, ORI

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 05/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/779,096

Applicant(s)

LIN ET AL.

Examiner

ori nadav

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) 5-7, 11, 12, 15-30, 32 and 33 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 13 and 31 is/are allowed.
- 6) ☒ Claim(s) 2 and 34-38 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 8-10 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 February 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s). Z.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

Art Unit: 2811

DETAILED ACTION

Election/Restriction

1. Applicant's election with traverse of the first embodiment, figures 3A, 3B and 12A and corresponding original claims 1-4, 8-10, 13-17, 26, 29, 31-33 and new claims 34-38 in Paper No. 6 is acknowledged. The traversal is on the ground(s) that although the figures are distinct, they are sufficiently related that it would not be an undue burden upon the examiner to examine both figures. This is not found persuasive because the application contains seven distinct embodiments, and examination of seven distinct inventions is an undue burden upon the examiner.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 15-17, 19, 26, 29 and 32-33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species. Independent claims 15, 32 and corresponding dependent claims 16-17, 19, 26, 29 and 33, respectively, are drawn to the embodiment of figures 8 and 12B ("an electrostatic discharge protection circuit, coupled between a first pad and a second pad"). There is no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 6. Claims 1-4, 8-10, 13-14, 31 and 34-38 are examined.

Art Unit: 2811

Oath/Declaration

3. The oath/declaration filed on 2/8/2001 is acceptable.

Drawings

4. The drawings are objected to because figures 1A and 1B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Correction is required.

Priority

5. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

6. If applicant is aware of any relevant prior art, he/she requested to cite it on form PTO-1449 in accordance with the guidelines set forth in M.P.E.P. 609.

Specification

7. The abstract of the disclosure is objected to because the abstract should be brief, no longer than 150 words. Correction is required. See MPEP § 608.01(b).

Art Unit: 2811

Claim Objections

8. Claims 3-4, 8-10, 14 and 34-38 are objected to because of the following informalities:
9. In claim 3, line 4, the term "0" after "resistor" should be deleted.
10. In claim 8, lines 1-2, the phrase "the first and the second ends" should read "the first end and the second end".
11. Claim 14 recites the limitation "the sixth doped region" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.
12. In claim 34, line 5, the phrase "the first and second doped regions" should read "the first doped region and the second doped region".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

13. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

14. Claims 2, 36 and 38 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 2811

15. Independent claims 1 and 34 recite a doped region of the first conductivity type electrically floated in a well. The phrase "electrically floated" means that the doped region of the first conductivity type has no external electrical connections. Dependent claims 2 and 38, respectively recite a capacitor coupled between a pad and the doped region of the first conductivity type. It is unclear how the doped region of the first conductivity type can be electrically floated in a well and at the same time be connected to a capacitor.

16. Independent claim 34 recites a first doped region of a second conductive type formed in the substrate, wherein the first and second doped regions being spaced apart enabling a channel region to be formed in between. dependent claim 35 further recites a first node is coupled to the first doped region through the well region. Referring to figure 3A, it is best understood that the first doped region is doped region 24, and the first node is the pad. Dependent claim 36 accurately recites the first node being coupled to the well region through the first doped region. Figure 3A clearly depicts the first node (the pad) being coupled to well region 18 through doped region 20 and not through the first doped region 24. Therefore, it is unclear how the first node is coupled to the well region through the first doped region, as recited in claim 36.

Art Unit: 2811

Claim Rejections - 35 USC § 102

17. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

18. Claim 34-35 and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Ham (5,903,420).

Regarding claim 34, Ham does not state whether the conductivity type of the substrate is an N type or P type. Both situations will be examined. Assume the substrate has an N conductivity type. Ham teaches in figure 6 and related text (column 3, line 57 to column 4, line 41) an electrostatic discharge protection circuit coupled between a first node Vss and a second node Vdd, comprising a substrate 20 of a first conductive type; a first doped region 48 and a second doped region 50 of a second conductive type formed in the substrate, the first and second doped regions being spaced apart enabling a channel region (under gate 27b) formed in between; a well region 22 of the second conductive type formed in the substrate; and a third doped region 46 of the first conductive type (note that the third doped region 46 can be an N or P conductive type (column 4, line 17)), electrically floated in the well region, wherein the first node Vss is electrically coupled to the first doped region 48 and the second node Vdd is electrically coupled to the second doped region 50.

Art Unit: 2811

Regarding the claimed limitation of a first doped region and a second doped region of a second conductive type formed in the substrate, doped regions 48 and 50 are formed in well 24, which in turn is formed in the substrate. Therefore, doped regions 48 and 50 are formed in the substrate, as claimed.

Assume now that the substrate has a P conductivity type. Ham teaches in figure 6 and related text (column 3, line 57 to column 4, line 41) an electrostatic discharge protection circuit coupled between a first node Vdd and a second node Vss, comprising a substrate 20 of a first conductive type; a first doped region 44 and a second doped region 42 of a second conductive type formed in the substrate, the first and second doped regions being spaced apart enabling a channel region (under gate 27a) formed in between; a well region 24 of the second conductive type formed in the substrate; and a third doped region 46 of the first conductive type (note that the third doped region 46 can be an N or P conductive type (column 4, line 17)), electrically floated in the well region, wherein the first node Vdd is electrically coupled to the first doped region 44 and the second node Vss is electrically coupled to the second doped region 42.

Regarding the claimed limitation of a first doped region and a second doped region of a second conductive type formed in the substrate, doped regions 44 and 42 are formed in well 22, which in turn is formed in the substrate. Therefore, doped regions 44 and 42 are formed in the substrate, as claimed.

Art Unit: 2811

Although Ham does not state that third doped region 46 is electrically floated, the third doped region 46 is not connected to any external connections, thus rendering it electrically floated.

Regarding 35, Ham teaches in figure 6 the first node Vss is coupled to the first doped region 48 through the well region 22 (the first situation), and the first node Vdd is coupled to the first doped region 44 through the well region 24 (the second situation).

Regarding 37, although Ham does not state that well regions 22 and 24, respectively, form a resistor element, well regions 22 and 24 form a resistor element because the current flowing in the well regions must have certain resistivity (see also figure 4 and column 2, lines 13-18).

Allowable Subject Matter

19. Claims 1, 13 and 31 are allowed over the references of record

20. Claims 3-4, 8-10 and 14 are objected, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 2811

Reasons for allowance

21. The following is an examiner's statement of reasons for allowance:

Avery (5,343,053) appears to be the closest prior art reference.

Regarding claims 1 and 31, Avery teaches in figure 9 a circuit coupled between a power line 45 and the pad 47 (see figure 13), comprising: a resistor constructed by a well region 434 of a second conductivity type deposited on a substrate 430 of a first conductivity type, the resistor comprising a first end and a second end, the first end being a doped region 440 of the second conductivity type at least partially overlapping the well region and coupled to the pad; a first doped region 436 of the first conductivity type, electrically floated in the well region; and an electrostatic discharge protection component 442, 444 coupled between the second end 448 and the second power line 45. Avery differs from the claimed structure in not having the circuit being the second circuit of an output buffer which in turn comprises a first circuit coupled between a first power line and a pad; and the second circuit coupled between a second power line and the pad. The allowability at least in part resides in the above described structure having elements which are not disclosed in the prior art searched. Therefore, prior art do not teach or render obviousness the semiconductor structure, as claimed.

Art Unit: 2811

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References C and N are cited as being related to ESD devices having floating regions.

Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to *Examiner Nadav* whose telephone number is **(703) 308-8138**. The Examiner is in the Office generally between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas, can be reached at **(703) 308-2772**.

Art Unit: 2811

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **308-0956**

A handwritten signature in black ink, appearing to read 'Ori Nadav', with a stylized flourish at the end.

Ori Nadav

May 22, 2002